REMARKS

Claims 2-5 have been clarified, by removing the unnecessary phrases "the steps of", "step of" and "in the area of the plasma", thereby making the language of the claims consistant. No new matter has been added. Upon entry of this amendment, claims 2-7 are present and active in the application.

Applicants thank Examiner Mayekar for the courteous and helpful telephone discussion held with applicants' representatives on January 22, 2009. During this discussion, applicants' representatives pointed out incompatibilities between two of the references cited against the application: Boulos, which describes only plasma produced by inductively coupled radio frequency radiation, and Sheer et al., which describes only plasma prepared using an electric arc between an anode and a cathode.

Methods for transferring energy to a precursor material by exposing it to a plasma are known. For example, precursor material may be introduced into a plasma at any point, such as at any point of the arc column, or at the anode. However, the synthesis of materials with controlled surface chemistry by exposing a precursor material to a plasma has not been described.

The present invention makes use of the discovery that stoichiometricly-nanostructured materials may be produced by the "active volume" of a plasma. The "active volume" in a plasma is created by introducing an oxidizing gas into the plasma, before the plasma is expanded into a field-free zone, either (1) in a region in close proximity to a zone of charge carrier generation, or (2) in a region of current conduction between field generating elements, including the surface of the field generating elements. The "active volume" is the most reactive part of the plasma and material synthesized in the "active volume" has unique surface chemistry.

The rejections of the claims under 35 U.S.C. 103, over Pirzada et al. or Chase, in view of Boulos, Sheer et al. and/or applicants' statements in the "BACKGROUND OF THE INVENTION" section of the application ("BACKGROUND"), are respectfully traversed. Boulos describes the distribution of electric current, current density, electrical conductivity, and particle trajectories, in a plasma produced by inductively coupled radio frequency radiation ("RF plasma"), while Sheer et al. describes injection of material into a cathodic column of an electric arc, a location which does not exist in an RF plasma.

Pirzada et al. and Chase have both been cited for describing the preparation of powders, such as cerium oxide powder or antimony oxide powder, using an RF plasma. Neither reference, however, suggests injecting a precursor material into the plasma through a current carrying region of an anodic column or a cathodic column.

Boulos describes principals and design features of RF plasmas. Included in this reference are details of the properties of RF plasmas, such as the distribution and magnitude of induced electric currents, as well as current density, electrical conductivity and particle trajectories within an RF plasma. There is no description of such properties within other types of plasma, such as a plasma generated using a free-burning electric arc.

Sheer et al. describes energy transfer using a fluid convection cathode plasma jet. This reference notes that the plasma streams away from the cathode tip, creating an "injection window" through which a medium may be directly injected into the arc column (col. 4, lines 9-42, and Figure 1). The BACKGROUND of the present application has been cited for generating a plasma and feeding a precursor to the plasma.

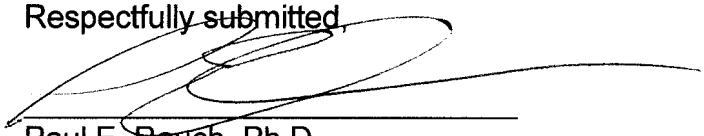
The claimed invention includes injecting a precursor material into a plasma through a current carrying region of an anodic column or a cathodic column. No anodic column or a cathodic column exists in an RF plasma, because an RF plasma is generated by induction; neither an anode nor a cathode is present in a device for generating an RF plasma. Accordingly, it would not be possible to inject a precursor material into an RF plasma, such as the RF plasmas described by Pirzada et al., Chase and Boulos, through a current carrying region of an anodic column or a cathodic column, because there is no anodic column or cathodic column in an RF plasma. Applicants submit that the claimed invention is not obvious over the applied references. Withdrawal of these grounds of rejection is respectfully requested.

The rejection of the claims under 35 U.S.C. 112, second paragraph, is respectfully traversed. Claim 1 has been amended so that the phrase "before the plasma is expanded into a field free zone" is used consistently within the claims to refer to the same location within the plasma. Furthermore, claims 2, 4 and 7 are not indefinite, since plasma generated by a transferred electric arc is a subclass of plasma

generated by a free-burning electric arc. Withdrawal of this ground of rejection is respectfully requested.

Applicants submit that the application is now in condition for allowance. Early notice of such action is earnestly solicited.

Respectfully submitted,



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